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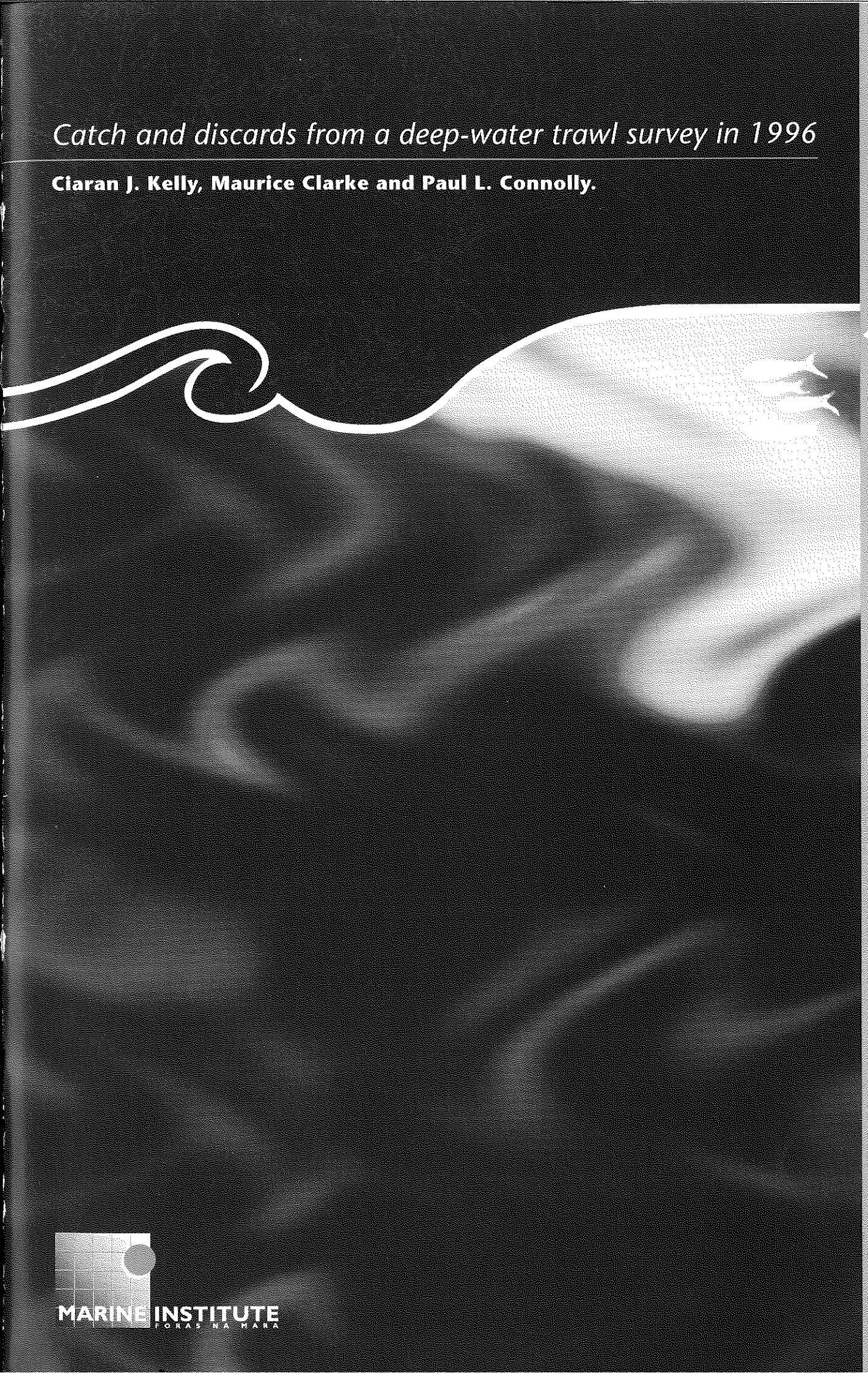

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CATCH AND DISCARDS FROM A DEEP-WATER TRAWL SURVEY IN 1996

by

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Summary

The Fisheries Research Centre has conducted a deep-water survey programme since 1993 and as part of this programme a deep-water trawl survey was carried out in September 1996. The survey fished areas along the continental slope west of Ireland from 52^0 N to 58^0 N at depths of 500-1,200m. The primary objective was to secure samples of potentially commercial deep-water shark and teleost species in order to examine aspects of their age, growth, reproduction and diet.

The survey was conducted on a chartered commercial fishing vessel using a deep-water otter trawl fitted with a small mesh cod-end liner. A total of 26 hauls were made during 87 hours of fishing and yielded a total catch of 29,345 kg. The ground covered ranged from mud to gravel and bare rock and there was no significant gear damage during the survey. Thirteen species of chondrichtian and 33 species of teleost fish were recorded. Length, weight sex and maturity data were taken from some of these species. The most abundant species in the catch were Baird's smoothhead, roundnose grenadier, leafscale gulper shark, black scabbard and orange roughy.

Trawl discards expressed as kg discarded per tonne of roundnose grenadier landed were calculated for a broad range of the most abundant species in the catch. During the survey in the Rockall Trough an estimated 16 t of deep-water species were discarded and results are compared to estimates for 1995. The main species discarded were smoothhead, squaliform sharks and *Lepidion eques*. Results indicate up to 16,783 t of deep-water species may have been discarded from the deep-water fishery in this area in 1996. This report documents the survey and presents some preliminary results. The data gathered during these surveys are currently under analysis at the FRC and the results will be published in the scientific literature.

INTRODUCTION

The development of the deep-sea fisheries in the northeast Atlantic and Irish research carried out on deep-water species have been reviewed in Connolly and Kelly (1996). The deep-water fishery to the west of Ireland is well established and provides important revenue for French and Spanish fleets which take the majority of the catches (Anon, 1996). The main species landed are roundnose grenadier, black scabbard and deep-water sharks. The total international landings from ICES Divisions VI and VII were 15,075 t in 1993 (latest complete figures). The UK Scottish fleet has recently commenced exploiting this fishery with the addition of several new 30 m vessels. These are capable of trawling deep-water (>500m) and presently target monkfish, blue ling and other deep-water species taken at the top of the continental slope.

There is still international concern over the uncontrolled exploitation of deep-sea resources (Hopper, 1995) and with little known about the basic biology of these species, ICES established a deep-water study group in 1994. The aim of this group is to describe the nature and extent of deep-water fisheries in the northeast Atlantic and to compile and analyse data on the species which are caught. Although there is some EU legislation restricting effort in this fishery, it is difficult to enforce and its effectiveness is questionable. According to the latest ICES deep-water study group the status of roundnose grenadier, black scabbard and orange roughy stocks to the west of Ireland are "unknown", "uncertain", and "possibly in decline" respectively. The lack of reliable fishing effort data is compounded by the lack of biological knowledge and this feature is particularly acute in the case of deep-water shark species.

There can be no doubt that the introduction of commercial deep-water trawling to the deep-water ecosystem has had some effects in terms of the bulk of species discarded and the associated trawl disturbance of the benthos. Connolly & Kelly (1996) have estimated that 7,500 t of deep-water species were discarded in ICES Division VI during 1995. The environmental impacts of this discarding are unknown and the paucity of data on the effects of trawling on the deep-sea bed has been recognised (Jones 1992).

The FRC commenced a deep-water survey programme in 1993 and analyses of the samples have been published in Gormley *et al.* 1994; Connolly *et al.* 1994; Kelly *et al* 1996, 1997, 1997 (in prep) and Connolly and Kelly, 1996. This leaflet documents the survey carried out in September 1996 and presents some preliminary results on catch and discards associated with commercial deep-water trawling operations. The primary purpose of the survey was to obtain samples of deep-water shark and fish species in order to provide the basic biological information necessary for any future management of the fishery. The data from these surveys will be analysed at the FRC as part of the EU-funded deep-sea Fisheries project (EU FAIR CT 96-655).

PERSONNEL

Trawl Survey (16 – 26 September 1996)

C. Kelly	Marine Institute, FRC Demersal Section	(Chief scientist)
M. Clarke	Marine Institute, FRC Demersal Section	

MATERIALS and METHODS

Haul durations ranged from approximately one hour to four hours. At each station, the position shot and hauled and the depth shot and hauled was noted. The ground trawled was monitored during each tow on the colour sounder, together with the warp lengths and tensions.

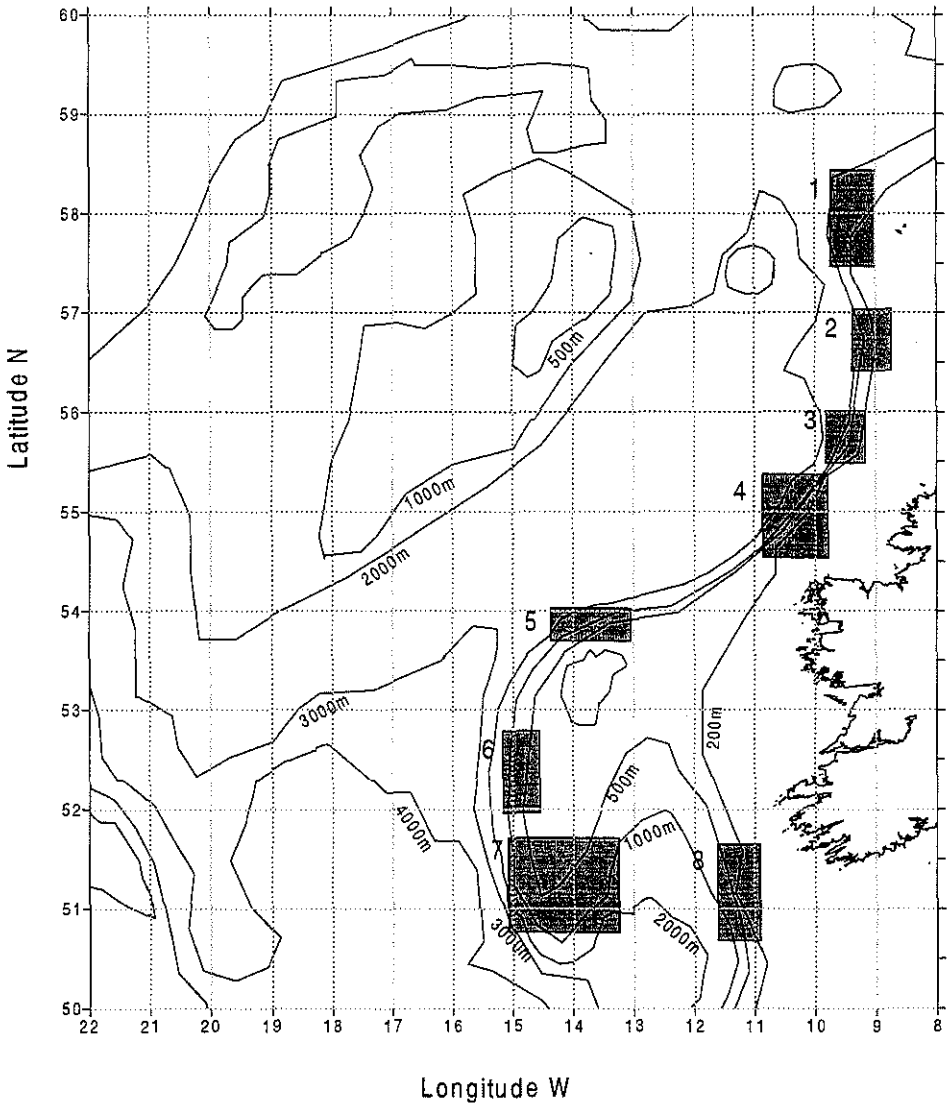
The catch was lowered into the stern fish deck and a note was made of the main species. Fish were identified using the Whitehead et al (1984-86), Compagno (1984) and Cohen et al (1990). Species that could not be identified on board ship were frozen for later examination. Samples of species of interest were taken from the stern fish pound and measured, weighed, sexed and staged for maturity. The crew processed the remainder of the fish. The remaining fish in the pound were sub-sampled (discards) and the total number of boxes discarded were counted. The number of boxes of commercial species taken from the haul was then recorded by species, and a selection of boxed fish was weighed to estimate the catch weight of each species. Total catch for the haul was given as weight of processed fish plus weight of sampled fish plus weight of discards. Otoliths were stored dry while stomachs and gonads were preserved in 10 saline formalin for histology samples and Gilson's fluid for fecundity estimates. Shark spines and centra were stored in 70 alcohol

A selection of fillets was frozen from roundnose grenadier, roughhead grenadier, redfish, blue ling, black scabbard, Baird's smoothhead and deep-water sharks for food analyses by the National Food Centre. The National Food Centre (Teagasc) will publish the results of the food analyses. Previous results of nutritional analyses and physical properties of deep-water fish fillets have been published by Gormley *et al* (1994).

Discarding rates were monitored on all hauls, and a sample of the discarded species measured in each Area.

The survey covered Areas 1-8 (52°N to 58°N) as defined in November 1995 (Connolly & Kelly, 1997). Tow locations were based on previous tows carried out by the *Mary M.* The species targeted were deep-water sharks; principally leafscale gulper, and Portuguese shark, roundnose grenadier, black scabbard and orange roughy. A map of the Areas fished is given in Figure 1 and a list of the latitude and longitude of each tow shoot and haul position is given in Table 1. As the same vessel and gear were used to conduct a similar survey in 1995 a comparison of catch rates for the most abundant species was possible.

Figure 1. Areas fished during the 1996 trawl survey on *Mary M*



RESULTS

TRAWL SURVEY LOG

Steam, September 15, 1996 Depart Lochinver Scotland 1200hrs.

Area 1, September 16 Arrive in Area 1 around 500hrs. Three tows were carried out over the depths 560-1026m. Catches mainly composed of roundnose grenadier *Lepidion eques* and black scabbard with some blue ling and leafscale gulper. Total catch for the day 2.3 t. Some coral damage on haul 1, weather 5-6.

Area 1&2, September 17 One further haul carried out in Area 1 followed by a short steam to Area 2. Three hauls completed today over the depth 792-912m. Catches mainly composed of monkfish, leafscale gulper and roundnose grenadier, total catch for the day 1 t. Ground very soft and muddy, weather initially freshening 6-7 but later decreasing 4-5. Steam for 5 hours to Area 3.

Area 3, September 18 Four tows carried out over the depth range 741-998m. Catches mainly composed of roundnose grenadier, blue ling and leafscale gulper, total catch for the day 2 t. No gear damage, weather fair. One French boat nearby in shallower water getting similar catches.

Area 4, September 19 Short steam to Area 4. Four tows carried out over the depth range 807-1083m. Catches mainly composed of roundnose grenadier, leafscale gulper and other deep-water shark species. Total catch for the day 2.4 t. No gear damage, weather fair.

Area 5, September 20 Spent much of the day steaming from Area 4. Two tows carried out over the depth range 1,045-1,073m. Catches mainly composed of roundnose grenadier, Baird's smoothhead, and birdbeak dogfish. There is a noticeable difference in the catch composition from Areas in the Rockall Trough. Very good catch rates, with a total catch for the day of 4.3t. No gear damage, weather fair.

Area 6, September 21 Two tows carried out over the depth range 1012-1045m. Huge bycatches of Bairds smoothhead (some rissos smoothhead) with smaller quantities of roundnose grenadier and deep-water sharks (leafscale gulper, *Centroscymnus coelolepis*). Total catch for the day 4.5 t. Weather calm 2-3.

Area 6& 7, September 22 Two more hauls carried out in Area 6 followed by a short steam to Area 7 where Two hauls were carried out. Depths covered 1056-1102m. As yesterday huge bycatches of smoothhead were taken with smaller quantities of orange roughy, black scabbards, roundnose grenadier, deep-water sharks (leafscale gulper, morid cod and blue ling. Total catch for the day 9 t. Weather beginning fine but later deteriorating rapidly to 5-7 southerly.

Area 7, September 23 Began the day steaming south. Two hauls carried out over the depth range 1056-1102m. Relatively poor catches, mainly composed of roundnose grenadier and spiny scorpionfish. Total catches for the day just over 1 t. Doors became stuck on haul 24 and it had to be hauled early. Some Spanish longliners were seen fishing in the Area. Decided to leave this ground and steam to Area 8.

Area 8, September 24 Arrive Area 8 at midnight. Two hauls carried out in this area based on French information. Ground hard gravel with very steep slopes. Hauls carried out in the depth range 912-969m. Catches mainly composed of smoothhead with small amounts of orange roughy and roundnose grenadier. Total catch for the day 2 t. Crossed doors on haul 26, caused damage to warps. Weather freshening 6-7.

Steam, September 25 Depart Area 8 and steam to Galway. Delayed for 6 hours waiting for tide in Galway Bay.

September 26 Unload gear and samples from boat, and return to FRC.

PRELIMINARY ANALYSES

Length frequencies of the most abundant shark species are given in Fig. 2. Sexual dimorphism was evident in all with females growing to a larger size. Male birdbeak and Portuguese showed modes at 85 and 95 cm respectively, although length frequencies for female fish showed no obvious mode, all fish of both species greater than 100 cm were female. The length frequency for male and female leafscale gulper showed the same mode at 110 cm but all fish over 120 cm were female. Most of the gonads in birdbeak dogfish were at an early stage of development and there were very few developing females and none carrying pups. Only one juvenile specimen at 80 cm was recorded. Most of the males were subadult. Female leafscale gulper were mainly juveniles, ripening and ripe females were present also. No females were found containing pups. Most male leafscale gulper were mature or maturing. Most female Portuguese shark were ripe, but females in other stages of development, including some carrying pups and some after pupping. The majority of male Portuguese shark were subadult.

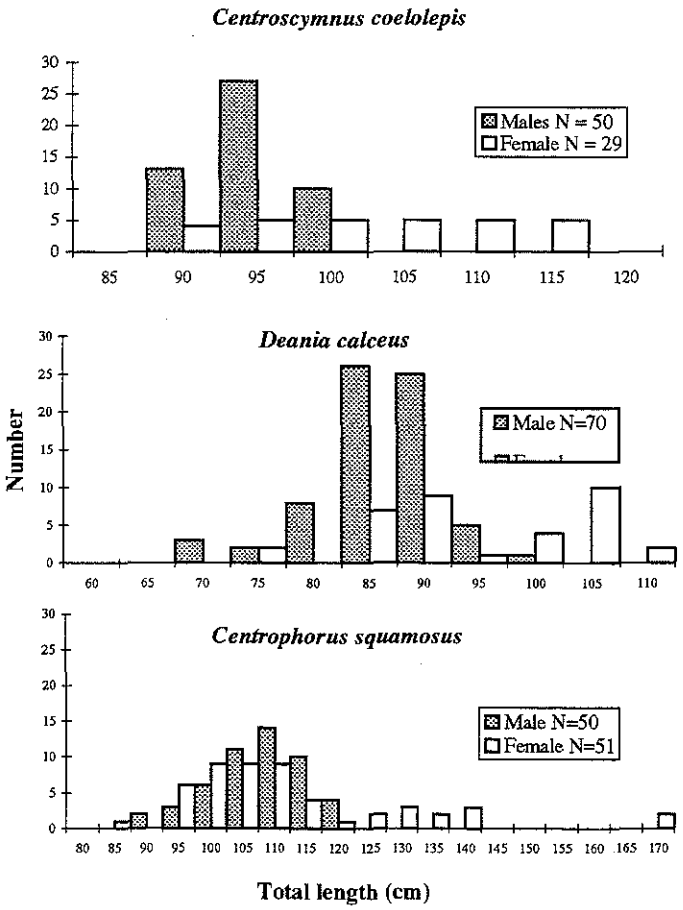
Catch rates for Portuguese shark in the Rockall Trough (Areas 1-4) were lower than those recorded for the 1995 trawl survey. In Area 4 the catch per unit effort (CPUE) in 1995 was 161 kg/hour while the 1996 rate was 38 kg/hour. In both cases 4 tows were completed in this area. For those areas on the slopes of the Porcupine Bank the catch rates were considerably down on the 1995 figures. However since the catch rates for the 1995 survey are based on only 1 and 2 hauls (Areas 6 and 7 respectively) it is difficult to make direct comparisons. Comparison of CPUE for leafscale gulper between the two surveys shows a decrease for Area 6 (Porcupine) from 20 to 13 kg/hour. However the figure for the 1995 trawl survey is based on only one haul, while that for 1996 is based on 5 hauls. A reversal of the overall trend is obvious from the rates for Area 3 where the rate was 15 kg/hour (3 hauls) in 1995 and 66 kg/hour (4 hauls) in 1996. Area 3 was the only area where catch rates for these two sharks were up on the 1995 figures. Furthermore,

the depth ranges sampled at each station in each of the years were often different (Table 2).

For Areas fished in the Rockall Trough, discards were expressed as kg discarded per t target species (roundnose grenadier) (Table 3). As there was no target species in the Porcupine Bank areas, discards were expressed as a percentage of the total catch (Table 4). The percentage of the total catch which was discarded in each Area is shown in Table 5. Discards from the Rockall Trough multiplied up to the total international catch for ICES Div VI (as in Connolly and Kelly (1996)) were compared with the results from a trawl survey carried out in the Rockall Trough in 1995 (Table 6).

Total discards for these species in 1996 multiplied to the international catch for ICES Div VI for the two commercially important shark species, leafscale gulper and Portuguese shark were considerably greater in 1996 than in 1995 (Table 6).

Figure 2. Length distribution of deep-water sharks taken during the 1996 trawl survey.



CONCLUSIONS

Overall catches during this survey were slightly higher than those in November 1995. A notable exception was the low catch rates of Portuguese shark in and around the Porcupine bank where relatively good catches had been obtained in 1995. During this survey Areas 3 and 4 showed a slight decrease in catch rate for black scabbard, with an increase in the catch rates of most other species, while in Areas 6 and 8 the catch rates of Baird's smoothhead were very high. With the exception of Area 3 the catch rates for the main shark species (leafscale gulper and *Centroscymnus coelolepis*) were lower in 1996

than 1995. A table of the catch rates of the main species by Area for 1995 and 1996 is given in Table 2.

It is not known if the decrease in catch rate for deep-water shark especially in the Porcupine is related to any change in the abundance of these species since 1995. Further information on the fishery is required before any conclusions can be drawn as to changes in the abundance of these species.

The relative proportions of many species discarded were the same as in 1995. However the discard rates for some shark species were quite different. The rates of discarding for leafscale gulper and *Portuguese shark* were much greater during the 1996 trawl survey, while those for birdbeak dogfish and longnose velvet dogfish were greater during the 1995 survey.

ACKNOWLEDGEMENTS

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Table 1. Station positions for deep-water trawl survey by *Mary M* 16 – 24 September 1996.

Area	Haul	Fishing duration (min)	Depth (m)	Position shot Lat °N	Long °W	Position hauled Lat °N	Long °W	Catch (kg)
1	1	155	810	58 21 0	9 19 0	58 15 0	9 35 0	1218
1	2	210	1026	58 13 0	9 39 0	58 7 17	9 53 52	510
1	3	180	560	58 9 10	9 40 92	58 17 87	9 39 94	563
1	4	210	817	58 12 98	9 36 76	58 2 10	9 41 75	437
2	5	155	792	56 30 75	9 11 81	56 23 87	9 10 99	90
2	6	165	912	56 26 25	9 11 94	56 35 72	9 13 1	377
3	7	240	898	56 53 70	9 25 6	55 43 16	9 30 16	490
3	8	165	998	56 46 61	9 27 77	55 53 95	9 25 78	685
3	9	180	741	55 52 0	9 22 98	55 43 31	9 27 57	681
3	10	125	767	55 45 42	9 30 39	55 37 83	9 32 94	231
4	11	240	1045	55 23 61	10 10 77	55 13 29	10 7 10	815
4	12	195	950	55 15 13	10 7 10	55 24 98	9 59 82	484
4	13	190	807	55 24 16	10 0 42	55 15 84	10 5 11	651
4	14	155	1083	55 17 80	10 6 50	55 25 1	10 1 99	504
5	15	180	1073	54 2 10	12 47 79	55 2 54	13 1 84	2800
5	16	150	1045	53 53 44	13 48 82	53 50 52	13 55 20	1520
6	17	240	1012	53 24 61	15 4 84	52 12 92	15 1 55	3848
6	18	240	1045	52 11 95	15 3 7	52 24 3	15 6 47	685
6	19	270	1056	52 23 91	15 6 45	52 12 76	15 4 37	4839
6	20	250	1077	52 12 99	15 4 8	52 24 99	15 7 29	912
6	21	300	1102	52 25 13	15 7 45	52 13 12	15 5 18	3267
7	22	245	1073	51 39 76	15 1 7	51 28 97	14 57 70	696
7	23	270	1056	51 28 44	14 57 12	51 41 20	15 2 61	418
7	24	50	1102	51 40 55	15 9 97	51 37 96	15 2 2	591
8	25	205	912	51 14 4	11 45 95	51 6 80	11 39 43	410
8	26	250	969	51 4 18	11 37 73	51 17 0	11 45 43	1623

Table 2. Catch per unit effort and depth distribution for the most abundant species during trawl surveys in November 1995 and September 1996.

Area		1996			1995		
		Depth (m)		CPUE	Depth (m)		CPUE
		min	max	(kg/hr)	min	max	(kg/hr)
3	*Alepocephalus bairdi*	767	767	0.53			
4		950	1,045	3.91			
5		1,045	1,073	58.95	57	1,100	1230
6		1,012	1,102	711.03			
8		969	969	345.60			
1	*Aphanopus carbo*	560	1,026	27.86	18	740	1172
3		767	767	12.16	13	900	900
4		807	1,083	15.81	17	790	1170
5		1,045	1,073	25.50	12	1,100	1230
6		1,056	1,102	33.47	11	1,270	1270
7		1,056	1,102	50.01			
8		912	969	11.99			
1	*Centrophorus squamosus*	560	1,026	21			
2		912	912	54.18			
3		741	998	66.38	15	900	900
4		807	1,083	69.93			
6		1,012	1,102	19.92	14	1,270	1270
7		1,056	1,102	58.29			
8		912	969	7.22			
1	*Centroscymnus coelolepis*	560	1,026	7.64	14	800	800
2		912	912	8.84	15	890	1050
3		998	998	8.84	11	1,160	1160
5		1,045	1,045	38.04	161	1,100	1230
6		1,012	1,102	23.25	405	1,270	1270
7		1,056	1,102	25.47	305	950	950
8		912	912	11.71			
1	*Coryphaenoides rupestris*	560	1,026	116.22	67	740	1172
2		912	912	49.09	55	890	1200
3		741	998	96.94	33	740	1160
4		807	1,083	82.52	37	790	1170
5		1,045	1,073	542.17	56	1,100	1230
6		1,045	1,102	42.49	11	1,270	1270
7		1,056	1,102	64.34	11	901	950
8		912	912	39.51			

Table 3. Discard rates (kg discarded per tonne roundnose grenadier landed) for Areas 1 to 4 in the Rockall Trough September 1996.

		Discard sampled	Total discard	Total target species	Discard rate
Area 1	*Lepidion eques*	39	277	1,265	219
	Centrophorus squamosus	206	206		163
	Coryphaenoides rupestris	24	185		146
	Daenia calceus	53	53		42
	Centroscymnus crepidater	42	42		33
	Phycis blennoides	28	28		22
	Centroscymnus coelolepis	26	26		20
	Helicolenus dactylopterus	1	7		5
	Hydrolagus mirablis	1	6		5
	Mora moro	1	6		4
Area 2	*Centrophorus squamosus*	149	149	135	1,104
	Centroscymnus coelolepis	24	24		180
	Centroscymnus crepidater	12	12		89
	Daenia calceus	12	12		85
Area 3	*Centrophorus squamosus*	603	603	1,125	536
	Chimaera monstrosa	25	25		22
	Daenia calceus	23	23		20
	Lepidion eques	17	17		15
	Centroscymnus crepidater	12	12		11
	Helicolenus dactylopterus	3	3		3
	Alepocephalus bairdi	1	1		1
	Nezumia aequalis	1	1		1
	Mora moro	1	1		1
	Hydrolagus mirablis	0	0		0
	Glyptocephalus cynoglossus	0	0		0
	Argentina silus	0	0		0
	Halargyreus johnsoni	0	0		0
Area 4	*Centrophorus squamosus*	896	896	1,035	866
	Squalidae	270	270		261
	Lepidion eques	18	75		72
	Alepocephalus bairdi	5	30		29
	Chimaera monstrosa	1	5		5
	Epigonus telescopus	1	4		4
	Centroscymnus crepidater	0	1		1
	Helicolenus dactylopterus	0	1		1
	Halargyreus johnsoni	0	1		1
	Trachyrhyncus scabrus	0	0		0
	Coelorhyncus coelorhyncus	0	0		0
	Glyptocephalus cynoglossus	0	0		0
	Nezumia aequalis	0	0		0

Discards were not sub-sampled in Area 2. The discard species shown for Area 2 include only non-commercial discards and were based on an estimate of the catch, thus many of the smaller species which are not abundant were not recorded.

Table 4. Discard quantity (kg) and rate(% of total catch discarded) for catches from the slopes of the Porcupine Bank

		Discard sampled	Total discard	Total catch	Discard rate
Area 5	*Alepocephalus bairdi*	27	301	4,319	6.96
	Daenia calceus	67	211		4.88
	Coryphaenoides rupestris	15	183		4.24
	Lepidion eques	13	124		2.87
	Chimaera monstrosa	9	111		2.57
	Hydrolagus mirablis	7	71		1.64
	Mora moro	0	45		1.04
	Alepocephalus rostratus	3	33		0.76
	Glyptocephalus cynoglossus	1	7		0.17
	Nezumia aequalis	1	5		0.13
	Hoplostethus atlanticus	1	1		0.03
	Trachyrhyncus murrayi	0	1		0.01
Area 6	*Alepocephalus bairdi*	9,439	9,439	13,552	69.66
	Centrophorus squamosus	382	382		2.82
	Alepocephalus rostratus	301	301		2.22
	Daenia calceus	63	63		0.46
Area 7	*Centrophorus squamosus*	345	345	1,704	20.24
	Daenia calceus	99	99		5.78
Area 8	*Alepocephalus bairdi*	1,440	1,440	2,033	70.83
	Centrophorus squamosus	58	58		2.85
	Totals	12,271	13,219	21,608	61.17

Table 5 Discard rates from all areas recorded during the trawl survey in 1996

Area	Discards (kg)	Catch (kg)	Discard rate
1	843	2,728	31
2	197	467	42
3	688	2,087	33
4	1,285	2,455	52
5	1,092	4,319	25
6	10,185	13,552	75
7	443	1,704	26
8	1,498	2,033	74

Table 6. Comparison of total discarding from the Rockall Trough in 1996 and 1995 (after Connolly & Kelly 1996) *.

	Discarded (t) in 1996	Discarded (t) in 1995
Centrophorus squamosus	5,337	962
Coryphaenoides rupestris	1,171	1,150
Lepidion eques	818	690
Centroscymnus coelolepis	802	385
Daenia calceus	393	1,156
Centroscymnus crepidater	268	1,291
Phycis blennoides	179	8
Alepocephalus bairdi	119	90
Chimaera monstrosa	109	199
Epigonus telescopus	34	43
Helicolenus dactylopterus	24	414
Hydrolagus mirablis	21	64
Mora moro	21	240
Nezumia aequalis	4	42
Halargyreus johnsoni	4	46
Argentina silus	3	24
Glyptocephalus cynoglossus	2	7

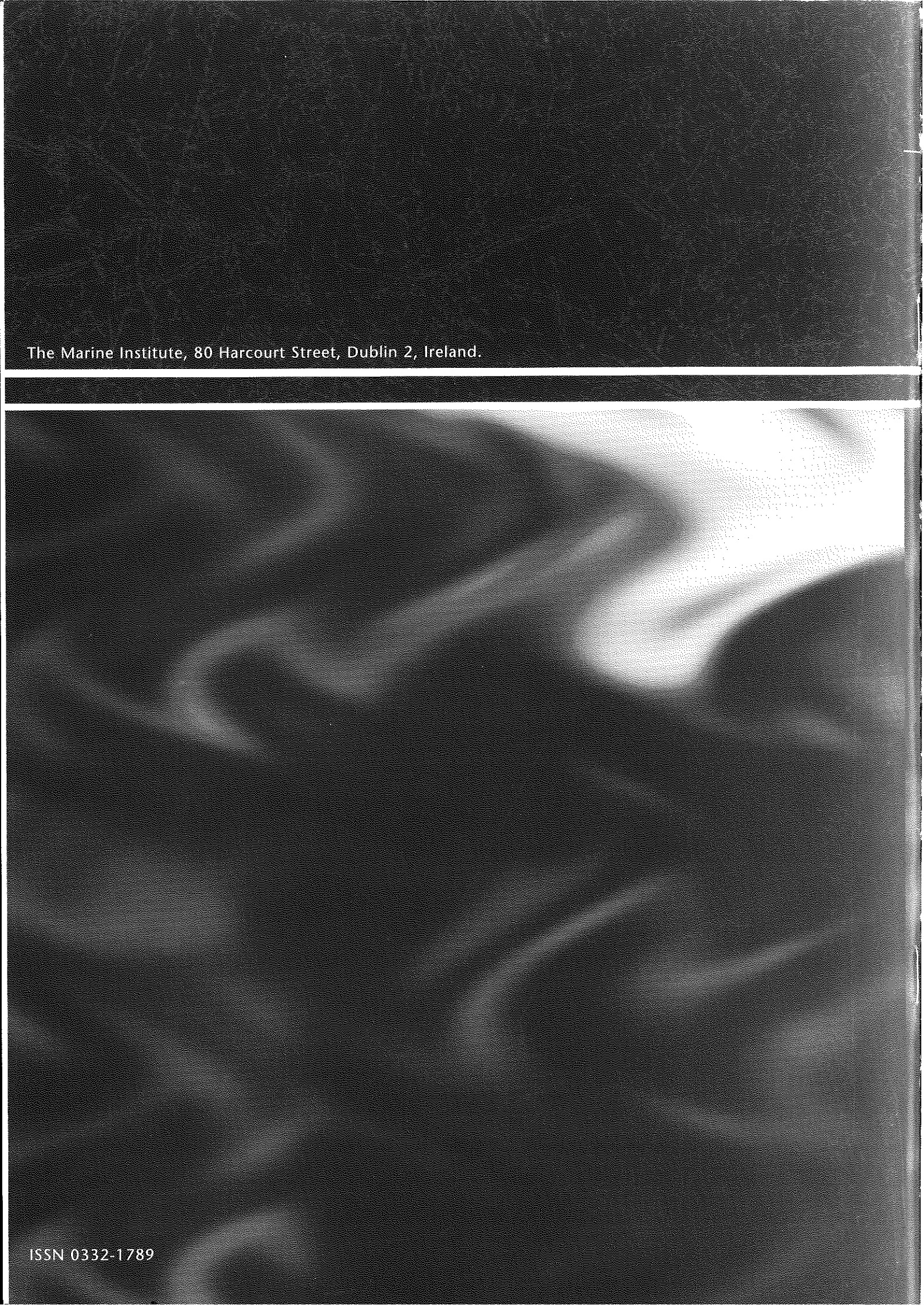
*Estimated 8,000 t roundnose grenadier landings in 1995 from ICES Division VI.

Table 7. Species identified on the 1996 deep water trawl survey. Classification after Whitehead *et al.* (1984, 1986).

SHARKS	**SELACHII**	
CATSHARKS	SCYLIORHINIDAE	
Blackmouth catshark	*Galeus melastomus*	common
Catshark	*Apristurus spp.*	locally common
DOGFISH SHARKS	SQUALIDAE	
Portuguese shark	*Centroscymnus coelolepis*	common
Leafscale gulper shark	*Centrophorus squamosus*	common
Birdbeak dogfish	*Daenia calceus*	common
Longnose velvet dogfish	*Centroscymnus crepidater*	common
Kitefin shark	*Dalatias licha*	rare
		common
ROUGH SHARKS	OXYNOTIDAE	
Sailfin roughshark	*Oxynotus paradoxus*	rare
RAYS	RAJIDAE	
Deepwater ray	*Raja bathyphilia*	common
Norwegian skate	*Raja nidarosiensis*	not common
Longnosed skate	*Raja oxyrinchus*	not common
RABBITFISH	CHIMAEREA	
Rabbitfish	*Chimaera monstrosa*	common
Large-eyed rabbitfish	*Hydrolagus mirablis*	common
BONY FISHES	**PISCES**	
SMOOTHHEADS	ALEPOCEPHALIDAE	
Baird's smoothhead	*Alepocephalus bairdii*	common
Risso's smoothhead	*Alepocephalus rostratus*	common
Bluntsnout smoothhead	*Xenodermichthys copei*	common
SEARSIDS	SEARSIDAE	
	Searsia spp.	not common
VIPERFISH	CHAULIODONTIDAE	
Sloane's viperfish	*Chauliodus sloanei*	not common
ARGENTINES	ARGENTINIDAE	
Greater argentine	*Argentina silus*	common
SAWTOOTHED EELS	SERRIVOMERIDAE	
Bean's sawtoothed eel	*Serrivomer beani*	not common
GRENADIERS	MACROURIDAE	
Smooth grenadier	*Nezumia aequalis*	common
Roundness grenadier	*Coryphaenoides rupestris*	common
Murray's longsnout grenadier	*Trachyrhyncus murrayi*	common

Table 7 (continued).

Blackspot grenadier	*Coelorhyncus coelorhyncus*	common
Spear-snouted grenadier	*Coelorhyncus occa*	common in southern Areas
Mediterranean longsnout grenadier	*Trachyrhyncus scabrus*	common in southern Areas
COD FISHES	GADIDAE	
Forkbeard	*Phycis blennoides*	common
Blue ling	*Molva dypterygia*	common
Silvery pout	*Gadiculus argenteus*	common
Torsk	*Brosme brosme*	
Blue whiting	*Micromesistius poutassou*	
MORIDS	MORIDAE	
	Halargyreus johnsonii	common
	Lepidion eques	
Morid cod	*Mora moro*	
TRACHICHYIDS	TRACHICHTHYIDAE	
Orange roughy	*Hoplostethus atlanticus*	locally common
OREOS	OREOSOMATIDAE	
False boarfish	*Neocyttus helgae*	not common
SNAKE MACKERELS	GEMPYLIDAE	
	Nesiarchus nasutus	rare
APOGONIDS	APOGONIDAE	
Cardinal fish	*Epigonus telescopus*	common
SCABBARD FISHES	TRICHURIDAE	
Black scabbard	*Aphanopus carbo*	common
WOLF FISHES	ANARHICHADIDAE	
Jelly wolf-fish	*Anarhichas minor*	not common
SCORPIONFISHES	SCORPAENIDAE	
Spiny scorpionfish	*Trachyscorpia cristulata*	locally common
Bluemouth rockfish	*Helicolenus dactylopterus*	common
Beaked redfish	*Sebastes mentella*	
FATHEADS	PSYCHROLUTIDAE	
Pallid sculpin	*Cottunculus thompsoni*	common
FLATFISH	PLEURONECTIDAE	
Witch	*Glyptocephalus cynoglossus*	common
ANGLERFISH	LOPHIIDAE	
Monkfish	*Lophius piscatorius*	common



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